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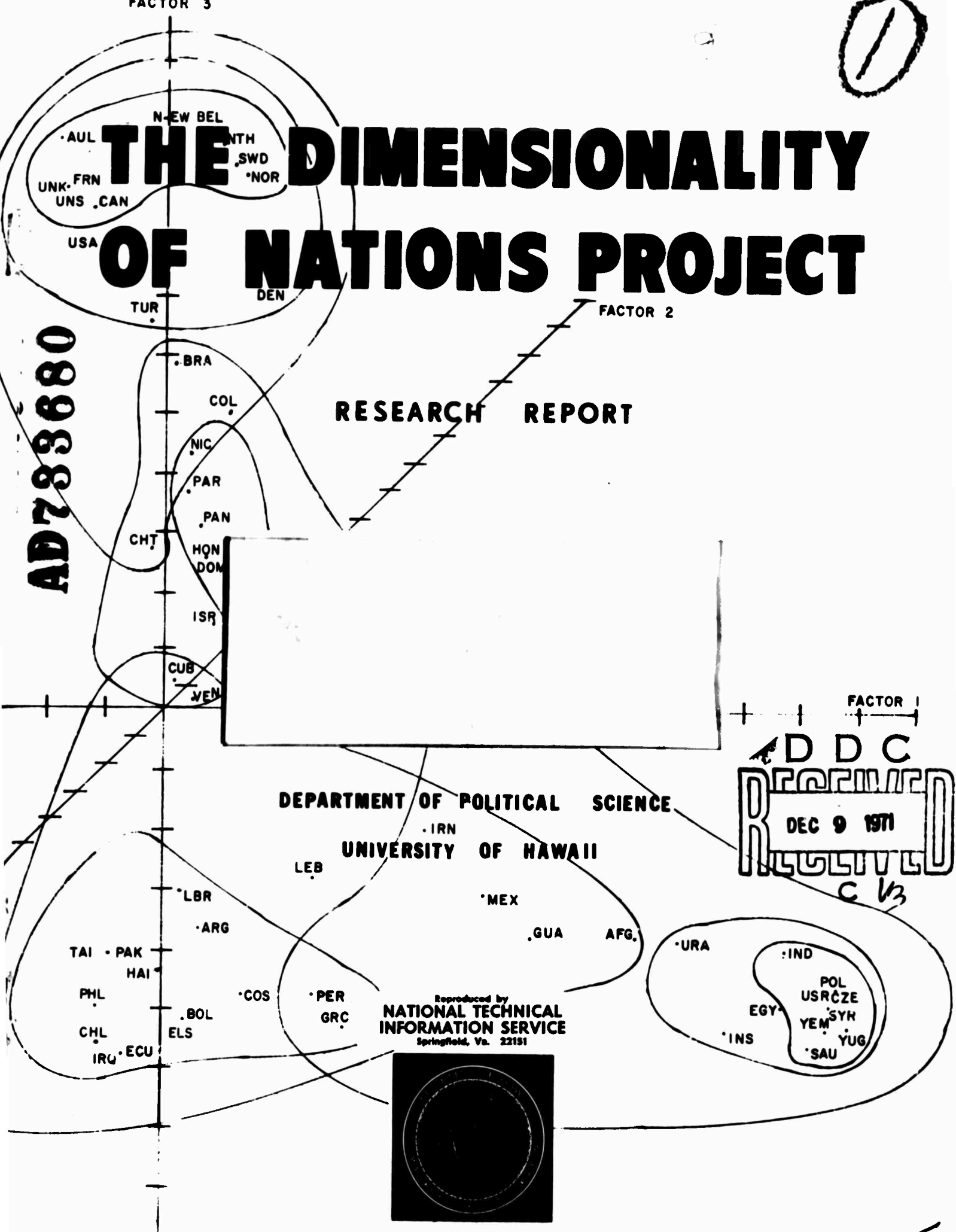
The Dimensionality of Nations Project

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Attribute and Behavioral Spaces
of Nations: Variables
and Samples for 1950

R. J. Rummel

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13. ABSTRACT

This report lists the nations and nation dyads to be factor analyzed for the year 1950, and is divided into two major sections. The first section is concerned with the variables and nations comprising 1950 attribute space; the second section gives the variables and dyads defining the behavior space of nations.

This is an in-house document of the Dimensionality of Nations Project for those associated with the project, and is part of the research on the behavioral and attribute dimensions of international relations.

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14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Field Theory						
Nation Attributes						
Nation Behavior						
International Relations System						
International Conflict						

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INTRODUCTION

A major goal of the Dimensionality of Nations Project (DON) is to determine the patterns of attributes and behavior of nations at five points in time: 1950, 1955, 1960, 1963, and 1965.[1] These data points were selected in terms of data availability and previous analyses, as well as to span the post-World War II changes in international relations. Once patterns are delineated at these five points, DON then can measure the change in international systems since 1950, plot the shift overtime in the behavior of particular nations or pairs of nations (dyads), such as the Soviet Union's behavior towards China and France to the U.S.A., and relate these movements to changes in socio-economic and political distances between nations.

Analyses of 1955 data into nation attribute and behavioral patterns have been completed.[2] In total, about five hundred variables, eighty-two nations, and over three-hundred pairs of nations were involved in the analyses.[3] Data collection for 1963 is virtually completed for about four hundred variables on over a hundred nations and the same number of pairs of nations as analyzed in 1955.[4]

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[1]Past and projected research and goals of DON are described in "The DON Project: A Five Year Research Program," Research Report No. 9, 1967. For an overview of project results, see "Some Empirical Findings on Nations and Their Behavior," Research Report No. 10, forthcoming, World Politics, January, 1969.

[2]See R. J. Rummel, "Some Attribute and Behavioral Patterns of Nations, "Journal of Peace Research, No. 2, 1967, and "Delineating International Patterns and Profiles," The Computer and the Policy Making Community, forthcoming, 1968. See also Jack Sawyer, "Dimensions of Nations: Size, Wealth, and Politics," American Journal of Sociology, September, 1967. The major work incorporating the 1955 findings is R. J. Rummel, Dimensions of Nations, forthcoming.

[3]The variables are described in the following DON Project reports: "236 Variable Revised List of Variables and Indices,"1963; "Definitions, Sources, and Years for 236 Variables," 1964; "Dyadic Study: Tentative Variable List," 1964. The nations analyzed are given in: "Dyadic Relations Random Sample," 1964 and "Dyadic Relations Selected Sample," 1964.

[4]The variables upon which data are being collected for 1963 are given in "Dyadic Study Second Revised Variable List," Research Report No. 3, 1966, and "Attribute Space of Nations for 1963: Variable List," Research Report No. 5, 1966. The selected sample of dyads remains the same as that employed for 1955. The random sample is listed in "1963 Dyadic Relations RANDOM Sample," Dimensionality of Nations Project, 1965.

This report lists the variables, nations, and dyads to be analyzed in 1950 and is divided into two major sections. The first section is concerned with the variables and nations comprising the 1950 attribute space. The second section gives the variables and dyads defining the behavior space of nations.

1. ATTRIBUTE SPACE

1.1 Variables. The following list of 97 variables is selected to encompass the widest range of variation among nations on their many diverse attributes. Data collected on these variables for 72 sovereign nations will be factor analyzed to define the 1950 dimensions of attribute space, as was done in 1955 and will be done for 1963. The Euclidean distance between nations on these dimensions then will be related to their 1950 behavior as defined in Section 2.

The analysis of the 97 variables given here will measure the stability of the dimensions of attribute space delineated for 1955 and 1963. Moreover, the change in attribute space location (factor scores) for nations between 1950, 1955, and 1963 can be related to shifts in behavior between nations (e.g., US→Cuba) during these periods.

The procedures for selecting the 97 variables are the same as those employed for the 1963 attribute space variables and were as follows:

(1) Five of the highest and substantively distinctive loading variables were taken from each oblique factor formed in 1955 data for 236 variables.[5] This will determine the replicability of the 1955 and 1963 dimensions and allow the shift in nation values to be measured.

(2) Ten of the variables with the lowest communalities and not otherwise selected by (1) above were included. Any change between 1950 and 1955 of the common and unique components of attribute space can thus be observed.

(3) Eight rescaled political variables from Banks and Textor, CROSS POLITY SURVEY, and three United Nations voting variables were included to give a better definition to the political dimensions found in 1955 data.

Where possible, adherence is given to the definitions of the variables in "Variable Definitions, Data Sources and Year," Dimensionality of Nations, 1964.

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[5]See "Oblique Rotated Tables for 236 Variables," Dimensionality of Nations Project, 1965.

1950 Attribute Space Variable List

Factor[6]	No.	List[7] No.	Code	Name	Set[8] No.	Columns[9]
Factor 1:	**Economic Development**					
	1.	(11)	TEL-PC	telephones / population	20	7-11
	2.	(3)	%A-POP	agricultural population / population	20	17-21
	3.	(83)	ENC-PC	energy consumption / population	20	27-31
	4.	(10)	ILLITE	illiterates / population 10 years of age or older	20	37-41
	5.	(23)	GNP-PC	GNP / population	20	47-51
Factor 2:	**Power Bases (Size)**					
	6.	(63)	EXPP	population x energy production	20	57-61
	7.	(29a)	NI	national income	20	67-71
	8.	(18)	POPULA	population	21	7-11
	9.	(190)	%CT-UN	UN assessment / total UN assessment	21	17-21
	10.	(60)	DEFEXP	defense expenditure	21	27-31
Factor 3:	**Political Orientation**					
	11.	(204)	E/TRSL	English titles translated/ foreign titles translated	21	37-41
	12.	(198)	BLOC	bloc membership	21	47-51
	13.	(202)	US/AID	US aid received / USSR and US aid received	21	57-61
	14.	(65)	TOTALI	freedom of opposition	21	67-71
	15.	(162)	TFC/GP	IFC and IBRD subscription / $(GNP)^2$ per capita	22	7-11
Factor 4:	**Foreign Conflict**					
	16.	(191)	THREAT	threats	22	17-21
	17.	(156)	ACCUSA	accusations	22	27-31
	18.	(157)	F-KILL	killed in foreign violence	22	37-41
	19.	(152)	MILACT	military action or not	22	47-51
	20.	(147)	PROTST	protests	22	57-61
Factor 5:	**Domestic Conflict**					
	21.	(144)	D-KILL	killed in domestic violence	22	67-71
	22.	(137)	STRIKE	general strikes	23	7-11
	23.	(141)	RIOTS	riots	23	27-31
	25.	(143)	DEMONS	demonstrations	23	37-41

[6]This is the 1955 oblique factor that the variables are selected to index.

[7]These numbers refer to the "236 Variable Revised List of Variables and Indices," Dimensionality of Nations Project, 1963.

[8]Set numbers are punched in columns 5-6 on data cards.

[9]These are the locations in which the data for the variables are to be punched.

Factor 6:   Catholic Culture

26.(123)	%CATH	Roman Catholics / population	23	47-51
27.(210)	US-DIS	air distance from U. S.	23	57-61
28.(195)	MED/NG	medicine NGO / NGO	23	67-71
29.(149)	ER-AMB	ambassadors expelled or recalled	24	7-11
30.(104)	DIV-MR	divorces / marriages	24	17-21

Factor 7:   Density

31. (17)	DNSITY	population / national land area	24	27-31
32. (43)	%ARABL	arable land / total land area	24	37-41
33. (41)	AREA	national area	24	47-51
34. (108)	RDS-KM	road length / national area	24	57-61
35. (110)	RR-KM	railroad length / national area	24	67-71

Factor 8:   Oriental Culture

36. (90)	RELGRP	religions	25	7-11
37. (216)	IM/I+E	immigrants / migrants	25	17-21
38. (45)	RAIN	average rainfall	25	27-31
39. (91)	RGRP/P	membership of largest religion / population	25	37-41
40. (103)	%D-WTR	dwellings with running water / dwellings	25	47-51

Factor 9:   (Unlabelled)

41. (222)	FST/ST	foreign college students / college students	25	57-61
42. (200)	NEUTRL	membership in Neutral bloc	25	67-71
43. (59)	NATAGE	age of country	26	7-11
44. (120)	REL/TI	religious titles published / book titles	26	17-21
45. (31)	%NI/P	% increase in national income / % increase in population	26	27-31

Factor 10:   Seaport Dependency

46. (215)	EMG/PP	emigrants / population	26	37-41
47. (118)	SG/GNP	seaborne goods / GNP	26	47-51
48. (192)	LAW/NG	law NGO / NGO	26	57-61
49. (33)	%UNEMP	unemployed / economically active population	26	67-71
50. (229)	EX/EPT	leading export / exports	27	7-11

Factor 11:   Diversity

51. (94)	LANGRP	languages	27	17-21
52. (95)	LGRP/P	membership of largest language group / population	27	27-31
53. (92)	ETHGRP	ethnic groups	27	37-41
54. (160)	AIDRVD	economic aid received	27	47-51
55. (168)	D-TR	technical assistance received	27	57-61

Factor 12:   Equality

56. (37)	(E-GVT	government education expenditures/ government expenditures	27	67-71
57. (35)	P-50%	percent population with 50% of land	28	7-11
58. (133)	N-AFFI	desire for affiliation	28	17-21
59. (127)	FM/WKS	female workers / economically active	28	27-31
60. (172)	MT/TRE	military treaties / treaties	28	37-41

Factor 13:   Traders

61.	(228)	EP/GNP	exports / GNP	28	47-51
62.	(132)	N-ACHV	desire for achievement	25	57-61
63.	(180)	MSNT,M	foreign mail sent / foreign mail	28	67-71
64.	(225)	IP/TRD	imports / trade	29	7-11
65.	(28)	P-INDX	cost of living index	29	17-21

Factor 14:   Sufficiency

66.	(50)	CAL-PC	calories consumed minus calories required / calories required	29	27-31
67.	(49)	PR/CAL	proteins / calories	29	37-41
68.	(205)	R/TRSL	Russian titles translated / foreign titles translated	29	47-51
69.	(62)	MIL/PP	military personnel / population	29	57-61
70.	(234)	BOT/GO	balance of investment / gold stock	29	67-71

Factor 15:   Unlabelled

71.	(78)	PARTYS	political parties	30	7-11
72.	(188)	ART/NG	arts and culture NGO / NGO	30	17-21
73.	(130)	COM/PP	communist party membership / population	30	27-31
74.	(76)	GUT-PC	government expenditure / GNP	30	37-41
75.	(129)	MONARC	monarchy or not	30	47-51

Unique Variables[10]

76.	(21)	PRIMCY	primacy (of largest city) measure	30	57-61
77.	(38)	PUP-PT	pupils in primary school / primary school teachers	30	67-71
78.	(72)	LAWTRA	legality of government change	31	7-11
79.	(73)	LEGIT	legitimacy of present government	31	17-21
80.	(93)	EGRP/P	largest ethnic group membership / population	31	27-31
81. ASSASS	(136)		assassinations	31	37-41
82. GVTCRS	(139)		major government crises	31	47-51
83. UNDE/C	(189)		UN delinquencies / assessment	31	57-61
84. BOP/GO	(227)		balance of payments / gold stock	31	67-71
85. INVBAL	(233)		balance of investments	32	7-11

Additional Political Variables

86.	STYLE	system style (0 = non-mobilizational; 1 = limited mobilizational; 2 = mobilizational)	32	17-21
87.	CONSTI	constitutional status (0 = totalitarian; 1 = authoritarian; 2 = constitutional)	32	27-31
88.	ELECTO	electoral system (0 = non-competitive; 1 = partially competitive; 2 = competitive)	32	37-41

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[10]These are the variables with among the lowest communalities (h^2); their communalities range from .24 to .49.

1.2 Nations. All nations that were sovereign in 1950, in the sense
of maintaining a foreign ministry and exchanging ambassadors with other
nations, are to be included in the data collection and analysis. Nations
that attained sovereignty between 1947 and 1948 were excluded. This is to
avoid mixing into the analysis variance associated only with the transition
of foreign and domestic policies and behavior from colonial status to
sovereignty. Small nations, such as Iceland, Kuwait, and Lichtenstein also
are excluded from the data collection.

The following nations were included in the 1955 analyses, but are to
be excluded from the 1950 analyses for the following reasons:

1. Austria: 1938-1955 occupied;
2. Cambodia: 1949-1953 colony;
3. Republic of China: independent only since 1949;
4. Germany (D.D.R.): occupied until 1949;
5. Germany (Fed. Rep.):   "   "   "
6. Japan: occupied until 1952;
7. Libya: 1946-1952 mandate;
8. Laos: 1949-54 colony;
9. Vietnam (North): became independent in 1954;
10. Vietnam (South):   "   "   "   " .

Egypt is questionable, but was finally included for 1950 based upon
Egypt being listed as independent from 1922-1956 by J. David Singer and
Bruce Russett in a forthcoming (1968) American Political Science Review
article.

The final list of nations for 1950 data collection is as follows:

Listing of Nations in the 1950 Analyses

I.D.*	Political Unit	Code Abbreviation	I.D.	Political Unit	Code Abbreviation
1.	Afghanistan	AFG	42.	Italy	ITA
2.	Albania	ALB	44.	Jordan	JOR
3.	Argentina	ARG	45.	Korea (Dem. Rep.)	KON
4.	Australia	AUL	46.	Korea (Rep. of)	KOS
6.	Belgium	BEL	47.	Lebanon	LEB
7.	Bolivia	BOL	48.	Liberia	LBR
8.	Brazil	BRA	50.	Mexico	MEX
9.	Bulgaria	BUL	51.	Nepal	NEP
10.	Burma	BUR	52.	Netherlands	NTH
12.	Canada	CAN	53.	New Zealand	NEW
13.	Ceylon	CEY	54.	Nicaragua	NIC
14.	Chile	CHL	55.	Norway	NOR
15.	China	CHN	56.	Outer Mongolia	OUT
17.	Colombia	COL	57.	Pakistan	PAK
18.	Costa Rica	COS	58.	Panama	PAN
19.	Cuba	CUB	59.	Paraguay	PAR
20.	Czechoslovakia	CZE	60.	Peru	PER
21.	Denmark	DEN	61.	Philippines	PHI
22.	Dominican Republic	DOM	62.	Poland	POL
23.	Ecuador	ECU	63.	Portugal	POR
24.	Egypt (UAR)	EGP	64.	Rumania	RUM
25.	El Salvador	ELS	65.	Saudi Arabia	SAU
26.	Ethiopia	ETH	66.	Spain	SPN
27.	Finland	FIN	67.	Sweden	SWD
28.	France	FRN	68.	Switzerland	SWZ
31.	Greece	GRC	69.	Syria	SYR
32.	Guatemala	GUA	70.	Thailand	TAI
33.	Haiti	HAI	71.	Turkey	TUR
34.	Honduras	HON	72.	Union of South Africa	UNS
35.	Hungary	HUN	73.	USSR	USR
36.	India	IND	74.	United Kingdom	UNK
37.	Indonesia	INS	75.	USA	USA
38.	Iran	IRN	76.	Uruguay	URA
39.	Iraq	IRQ	77.	Venezuela	VEN
40.	Ireland	IRE	78.	Yemen	YEM
41.	Israel	ISR	79.	Yugoslavia	YUG

N = 72

*Each nation's I.D. is the same for the 1950, 1955, and 1963 data collections and analyses.

2. BEHAVIORAL SPACE

2.1 <u>Variables</u>. As in the 1963 dyadic list, variables have been classified by domain and domain by analytical category. The domains serve to organize the variables according to the major concept they were selected to index. Analytical categories indicate the level of analysis at which the variables function. Corresponding to the analytical theory[11] in which the dyadic analyses are now imbedded, there are two such categories: the <u>behavioral</u> and <u>attribute</u> spaces. The behavioral space encompasses the international behavior of governments and people towards each other. The attribute space comprises those characteristics of a nation that distinguish it from at least some other nations. The theory is that the Euclidean distances between two nations in the space of their attributes are forces acting on the location (components) of the dyad in behavioral space.

Section 1.1, above, lists variables defining attribute space. The data are collected for these variables on each nation given in Section 1.2. The order of the matrix formed from these data is 72 nations by 94 attributes. The attribute space variables collected for dyads, however, are on pairs of nations, and consist of the attribute of the actor, and the socioeconomic, geographic, and cultural distances between actor and object. Thus, the matrix formed from this attribute data is of order dyads by attributes. The attribute variables of Section 1.1 locate a nation in attribute space; the attribute variables to be given below for dyads measure how close two nations are in the space.

Some of the dyadic variables are grouped into a third methodological category. This involves indicators of the unreliability of the data collected for the variables classified under the behavior or attribute categories.

As for 1955 and 1963, the behavior and attribute variables will be factor analyzed separately and together. Regressions of selected behavioral variables onto distances in attribute space will be done to further explore a "force" hypothesis, and canonical analysis will be employed to ascertain the "fit" of the two spaces.

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[11] R. J. Rummel, "A Field Theory of Social Action with Application to Conflict Within Nations," <u>General Systems</u>, Vol. X, 1965.

1950 Dyadic Variable List

System and Domain	Variable No.	Variable Code	Variable	IBM Card Set No.	Columns
I BEHAVIORAL					
A. Official Collaboration					
	1.	AID:	economic aid A →B[12]	1	7-11
	2.	R-AID:	relative[13] economic aid A→ B	1	17-21
	3.	TREATY:	treaties A↔B	1	27-31
	4.	R-TRTY:	relative treaties A↔B	1	37-41
	5.	VISITS:	official visits A →B	1	47-51
	6.	CONFER:	co-participation in international conferences A↔B	1	57-61
B. Communications					
	7.	MAIL:	mail A→B	1	67-71
	8.	R-MAIL:	relative mail A→B	2	7-11
	9.	M/DOMM:	mail (A→B) / A's domestic mail	2	17-21
	10.	BOOKS:	export of books and magazines A→B	2	27-31
	11.	R-BOOK:	relative export of books and magazines A→B	2	37-41
	12.	TRANSL:	book translations[14] A of B	2	47-51
	13.	R-TRAN:	relative book translations[14] A of B	2	57-61
	14.	(Undefined)		2	67-71

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[12]The arrow indicates the direction of the relationship between nation A and nation B that is evaluated on the variable. Thus, A→B for variable 1 means that data will be collected on the amount of economic aid that A has given to B. Symmetrical relationships, such as trade, are indicated by A↔B.

[13]All "relative" variables are calculated thusly:

$$\frac{x \quad A \rightarrow B \quad (\text{or } A \leftrightarrow B)}{all \quad x \quad of \ A}$$

where x refers to the relationship, such as economic aid, being considered. If all x of A = 0, then the ratio = 0.

[14]Treated as non-applicable to pairs of nations with predominantly the same language.

C. Conflict

15.	factor scores[15] on rotated conflict factor 1, A↔B	3	7-11
16.	factor scores[15] on rotated conflict factor 2, A↔B	3	17-21
17.	factor scores[15] on rotated conflict factor 3, A↔B	3	27-31
18.	factor scores[15] on rotated conflict factor 4, A↔B	3	37-41
19.	factor scores[15] on rotated conflict factor 5, A↔B	3	47-51
20. CONTOT:	total conflict[16] A↔B	3	57-61
21. CONFLI:	incidence of conflict[17] A↔B	3	67-71
22.	(undefined)	4	7-11
23.	"	4	17-21
24.	"	4	27-31
25.	"	4	37-41
26. CONALY:	B is in direct or indirect conflict[18] with A, A↔B	4	47-51
27.	(undefined)	4	57-61
28.	"	4	67-71

D. International Politics

29. MILTRT:	military treaties A↔B	5	7-11
30. R-MILT:	relative military treaties A↔B	5	17-21
31. WD-UN:	weighted distance[19] on major rotated dimensions of UN voting, A↔B	5	27-31
32. D-UN:	unweighted distance[20] on major rotated dimensions of UN voting, A↔B	5	37-41

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[15]These factor scores are derived from a factor analysis of foreign conflict data coded from the daily New York Times. The sample for this analysis is not restricted to the random and selected samples of the dyadic study, but includes all dyads evidencing any conflict behavior recorded in the NYT.

[16]Measured as the sum (with all signs reversed for scores on a factor with all high negative loadings) of factor scores on the five major conflict factors.

[17]The dyad has no standardized factor score greater or equal to an absolute value of 1.50 on any conflict dimension equals 0; otherwise equals 1.

[18]Conflict is measured as in footnote 17. If B is in conflict with allie of A, or A is in conflict with allie of B, or A is in conflict with B, then dyad is given a 1; otherwise 0.

[19]Distance on major dimensions together =

$$\sqrt{\sum_{i=1}^{P} \left[a_i \ (A_i - B_i)\right]^2}$$

where i = a particular dimension, p = the number of major dimensions being considered, a = the percent of variance of UN voting accounted for by a dimension, and $A_i - B_i$ = the difference in factor scores of A and B on a dimension. This formula is for the Euclidean distance in p dimensional space, when each dimension is weighted for importance.

[20]The dimension i of footnote 6 = 1 for all i dimensions.

33. D-UNF1: distance[21] on first rotated dimension of
　　　　　　UN voting, A↔B   5   47-51
34. D-UNF2: distance[21] on second rotated dimension of
　　　　　　UN voting, A↔B   5   57-61
35. D-UNF3: distance[21] on third rotated dimension of
　　　　　　UN voting, A↔B   5   67-71
36. MILAID: military aid A↔B   6   7-11
37. R-MLAD: relative military aid A→B   6   17-21

E. Mobility
38. TOURIS: tourists A→B   6   27-31
39. R-TOUR: relative tourists A→B   6   37-41
40. T/POPU: tourists (A→B) / A's population   6   47-51
41. EMIGRA: emigrants A→B   5   57-61
42. R-EMIG: relative emigrants A→B   6   67-71
43. E/POPU: emigrants (A→B) / A's population   7   7-11
44. STUDNT: students A→B   7   17-21
45. R-STUD: relative students A→B   7   27-31

F. Trade
46. EXPORT: exports A→B   7   37-41
47. R-EXPT: relative exports A→B   7   47-51
48. E/GNP: exports (A→B) / A's GNP   7   57-61
49. C/EXP: largest commodity export A→B / A's exports A→B   7   67-71

G. Cooperation
50. IGO: intergovernmental organizations (IGO) of which
　　　　A and B are both members A↔B   8   7-11
51. R-IGO: relative IGO A↔B   8   17-21
52. NGO: non-governmental international organizations
　　　　(NGO) of which A and B are both members A↔B   8   27-31
53. R-NGO: relative NGO A↔B   8   37-41
54. N-IGO: IGO A↔B / common membership of A   8   47-51
55. N-NGO: NGO A↔B /   "   "   " "   8   57-61
56. (undefined)   8   67-71
57.   "   9   7-11
58. EMBLEG: embassy or legation A→B = 1, none = 0   9   17-21
59. R-EMB: relative diplomatic representation A→B   9   27-31
60. (undefined)   9   37-41
61.   "   9   47-51

H. Communication System
62. TELTRM: telephone cable terminals A↔B   10   7-11
63. TELCHN: telephone communication linkage   10   17-21
64. (undefined)   10   27-31
65.   "   10   37-41

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[21]Calculated thusly: $\sqrt{(\text{A's factor score} - \text{B's factore score})^2}$

I. **Historical Influences**

66. WAROPP:	time since opposite sides of a war[22] A↔B	10	47-51
67. WARSAM:	time since on same sides of a war[22] A↔B	10	57-61
68. LOSTER:	A has lost, and not regained, territory to B since 1900 = 1; no = 0	10	67-71
69. DEPEND:	A once a colony, territory or part of homeland of B[23]	11	7-11
70. INDEP:	Independence of A and B predates 1946 = 1, no = 0	11	17-21

J. **Bloc Politics**

71. COMBLC:	common bloc[24] membership A↔B = 2; different = 1; opposing = 0	11	27-31
72. COMPOS:	bloc position[25] index A↔B	11	37-41
73. ALLIAN:	military alliance A↔B = 1; no = 0	11	47-51

II. **ATTRIBUTE SYSTEM**

K. **Basic Characteristics**[26]

74. ENCONS:	energy consumption per capita of A	12	7-11
75. N.I.:	national income of A	12	17-21
76. FREED:	freedom of opposition in A	12	27-31
77. CATHOL:	proportion of Roman Catholics in A	12	37-41
78. THREAT:	threats of A (tentative)	12	47-51
79. DENSIT:	density in A	12	57-61
80. DOMKIL:	domestic killed in A	12	67-71

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[22]Rating: pre-1900 or never = 0; 1901-1910 = 1, 1911-1920 = 2, 1921-1930 = 4, 1931-1940 = 8, 1941-1950 = 16, 1951-1960 = 32, 1961-   = 64.

[23]Refer to footnote 22.

[24]Blocs considered are Communist, Neutral, and Western.

[25]Bloc position A↔B measured as absolute difference of position on following scale:

1	2	3	6	7
USA	non-USA Western bloc member	neutral bloc member	non-USSR Communist bloc member	USSR

[26]These are the basic indicators that index the major dimensions of covariation among nations. They were derived from a factor analysis of 236 variables for 82 nations on 1955 data. See R. J. Rummel, Dimensions of·Nations, forthcoming; or R. J. Rummel, "Some Attributes and Behavioral Patterns of Nations," Journal of Peace Research No. 2, 1967.

L. Distances

81. D-ECON:	distance[27] in economic development A↔B	13	7-11
82. D-POWR:	distance[27] in power bases A↔B	13	17-21
83. D-POLI:	distance[27] in political system A↔B	13	27-31
84. D-CATH:	distance[27] in Catholic culture A↔B	13	37-41
85. D-FCON:	distance[27] in foreign conflict A↔B	13	47-51
86. D-DENS:	distance[27] in density A↔B	13	57-61
87. D-DCON:	distance[28] in domestic conflict A↔B	13	67-71
88. D-TOTL:	distance[28] on all major dimensions A↔B	14	7-11
89. D-RANK:	social rank distance[29] A↔B	14	17-21
90. D-RUSS:	Russett's distances[30] A↔B	14	27-31
91. (undefined)		14	37-41
92. "		14	47-51
93. "		14	57-61
94. "		14	67-71
95. "		14	7-11
96. P1 + P2:	joint power potential[31] A↔B	14	17-21

M. Geographic

97. D-TCEO:	global distance between capitols A↔B	15	27-31
98. D-TGEO:	global distance between territorial borders A↔B	15	37-41
99. PANAM:	Pan Am ticket price between capitols A↔B	15	47-51
100. (undefined)		15	57-61
101. CONTIG:	contiguous territory and border easy to cross A↔B = 2; militarily difficult to cross by land = 1; non-contiguous = 0	15	67-71

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[27] See footnote 21. The dimensions on which these distances are calculated are derived from the 236 variable analysis mentioned in footnote 26.

[28] See footnote 20. See footnote 26 for source.

[29] Calculated in the space of economic development (wealth) and power bases (size) dimensions. Prestige is assumed to be mainly indexed by these two dimensions.

[30] Distances between nations computed by Bruce Russett on the four main dimensions (excluding size) to emerge from a factor analysis of Russett, et al, World Handbook of Social and Political Indicators, 1965. See Bruce Russett, International Regions and the International System, Rand McNally, 1967.

[31] Calculated by formula:

(national income of A) + (national income of B)

This gives a measure of the ability of two nations to span distance between them and thus to interact.

Population Characteristics

III ERROR

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[32]Calculated as the vector product, $V_A^* V_B$, where the asterisk means vector transposed. The elements of V_A and V_B are the proportions of the population of each nationality (race, religion, language) that A and B have in common. Thus, the higher the value of the resulting scaler, $V_A^* V_B$, for A↔B, the more in common A and B are on these population characteristics.

[33]An index to the reliability of trade data, and possibly of other inter-action data as well.

[34]An index of the world interest in the pair of nations, and thus of the possibility that data, such as conflict and collaboration, might be omitted from the sources.

[35]An index to the joint economic development of two nations and thus of the development of their statistical agencies. This development has some bearing on the quality of the data published.

[36]Censorship is rated as 0 = complete or fairly complete censorship; 1 = some news censorship, 2 = no censorship, other than usual laws about libel and the controlling of news of a national security value.

[37]The frequency of missing data for the dyad A→B or A↔B for all variables included in the analysis.

[38]When included in the factor analyses, it will help indicate at what point the variance on a factor may be due to chance concomitance.

[39]This norms variable 106 by the total amount of trade between two nations.

2.2 <u>Dyadic Random Sample</u>. All 72 sovereign nations in 1950 (see Section 1.2) were numbered. Eighty pairs (dyads) of nations then were selected by consecutive numbers in a random table (the page of random numbers and the first number used were selected randomly as well).

As with the 1955 and 1963 dyadic random samples, three dyads, US-USSR, US-France, and USSR-China were added to the sample. Their theoretical value is believed to outweigh the consequent slight loss of randomness.

Since two directions of relationship A→B and B→A are considered for each dyad A - B, the sample of 83 dyads becomes a sample of 166 dyadic relations out of a population of 2,556 such relationships for 1950. Degrees of freedom employed in statistical tests must be computed, however, on N = 83.

The selection procedure resulted in all except four of the 72 nations being included in at least one dyad. Those not included are Jordan, North Korea, Panama, and the Union of South Africa.

The random sample of 166 dyads is as follows:

1950 Dyadic Random Sample

I.D.	Code	Name	I.D.	Code	Name
001	AFG→BRA	Afghanistan→Brazil	048	ELS→ISR	El Salvador→Israel
002	AFG→IRN	Afghanistan→Iran	049	ELS→TAI	El Salvador→Thailand
003	AFG→YUG	Afghanistan→Yugoslavia	050	ETH→CAN	Ethiopia→Canada
004	ALB→USR	Albania→USSR	051	ETH→NTH	Ethiopia→ Netherlands
005	ARG→PAR	Argentina →Paraguay	052	ETH→TAI	Ethiopia→Thailand
006	ARG→UNK	Argentina→United Kingdom	053	FIN→ISR	Finland→Israel
007	AUL→SAU	Australia→Saudi Arabia	054	FIN→PAK	Finland→Pakistan
008	BEL→OUT	Belgium→Outer Mongolia	055	FRN→IRQ	France→Iraq
009	BOL→ITA	Bolivia→Italy	056	FRN→MEX	France→Mexico
010	BRA→AFG	Brazil→Afghanistan	057	FRN→NEW	France→New Zealand
011	BRA→LEB	Brazil→Lebanon	058	FRN→USA	France→USA
012	BRA→NOR	Brazil→Norway	059	GRC→OUT	Greece→Outer Mongolia
013	BUL→CAN	Bulgaria→Canada	060	GRC→URA	Greece→Uruguay
014	BUL→CHN	Bulgaria→China	061	GUA→CAN	Guatemala→Canada
015	BUL→HON	Bulgaria→Honduras	062	GUA→URA	Guatemala→Uruguay
016	BUR→ELS	Burma→El Salvador	063	GUA→YUG	Guatemala→Yugoslavia
017	CAN→BUL	Canada→Bulgaria	064	HAI→COS	Haiti→Costa Rica
018	CAN→COS	Canada→Costa Rica	065	HAI→ELS	Haiti→El Salvador
019	CAN→ETH	Canada→Ethiopia	066	HAI→OUT	Haiti→Outer Mongolia
020	CAN→ITA	Canada→Italy	067	HON→BUL	Honduras→Bulgaria
021	CAN→POR	Canada→Portugal	068	HON→HUN	Honduras→Hungary
022	CEY→LBR	Ceylon→Liberia	069	HON→SWD	Honduras→Sweden
023	CEY→PHI	Ceylon→Philippines	070	HUN→COS	Hungary→Costa Rica
024	CHN→BUL	China→Bulgaria	071	HUN→ELS	Hungary→El Salvador
025	CHN→SPN	China→Spain	072	HUN→HON	Hungary→Honduras
026	CHN→USR	China→USSR	073	HUN→IRQ	Hungary→Iraq
027	CHN→YEM	China→Yemen	074	HUN→URA	Hungary→Uruguay
028	COL→NEW	Colombia→New Zealand	075	INS→SPN	Indonesia→Spain
029	COS→CAN	Costa Rica→Canada	076	IRN→AFG	Iran→Afghanistan
030	COS→HAI	Costa Rica→Haiti	077	IRN→URA	Iran→Uruguay
031	COS→HUN	Costa Rica→Hungary	078	IRQ→FRN	Iraq→France
032	COS→NIC	Costa Rica→Nicaragua	079	IRQ→HUN	Iraq→Hungary
033	CUB→CZE	Cuba→Czechoslovakia	080	IRQ→PAK	Iraq→Pakistan
034	CUB→ELS	Cuba→El Salvador	081	IRE→OUT	Ireland→Outer Mongolia
035	CZE→CUB	Czechoslovakia→Cuba	082	IRE→SWZ	Ireland→Switzerland
036	DEN→KOS	Denmark→Korea (Rep. of)	083	ISR→ELS	Israel→El Salvador
037	DEN→SPN	Denmark→Spain	084	ISR→FIN	Israel→Finland
038	DEN→URA	Denmark→Uruguay	085	ISR→POL	Israel→Poland
039	DOM→SWD	Dominican Republic→Sweden	086	ISR→SAU	Israel→Saudi Arabia
040	ECU→YUG	Ecuador→Yugoslavia	087	ITA→BOL	Italy→Bolivia
041	EGP→LBR	Egypt→Liberia	088	ITA→CAN	Italy→Canada
042	EGP→POL	Egypt→Poland	089	KOS→DEN	Korea→(Rep. of) Denmark
043	EGP→POR	Egypt→Portugal	090	LEB→BRA	Lebanon→Brazil
044	ELS→BUR	El Salvador→Burma	091	LBR→CEY	Liberia→Ceylon
045	ELS→CUB	El Salvador→Cuba	092	LBR→EGP	Liberia→Egypt
046	ELS→HAI	El Salvador→Haiti	093	LBR→SYR	Liberia→Syria
047	ELS→HUN	El Salvador→Hungary	094	MEX→FRN	Mexico→France

095	NEP→NTH	Nepal→Netherlands
096	NEP→PHI	Nepal→Philippines
097	NEP→RUM	Nepal→Rumania
098	NTH→ETH	Netherlands→Ethiopia
099	NTH→NEP	Netherlands→Nepal
100	NTH→RUM	Netherlands→Rumania
101	NEW→COL	New Zealand→Colombia
102	NEW→FRN	New Zealand→France
103	NEW→YUG	New Zealand→Yugoslavia
104	NIC→COS	Nicaragua→Costa Rica
105	NIC→PAR	Nicaragua→Pakistan
106	NOR→BRA	Norway→Brazil
107	NOR→POR	Norway→Portugal
108	OUT→BEL	Outer Mongolia→Belgium
109	OUT→GRC	Outer Mongolia→Greece
110	OUT→HAI	Outer Mongolia→Haiti
111	OUT→IRE	Outer Mongolia→Ireland
112	OUT→RUM	Outer Mongolia→Rumania
113	OUT→USA	Outer Mongolia→USA
114	PAK→FIN	Pakistan→Finland
115	PAK→IRQ	Pakistan→Iraq
116	PAK→NIC	Pakistan→Nicaragua
117	PAK→TAI	Pakistan→Thailand
118	PAR→ARG	Paraguay→Argentina
119	PAR→RUM	Paraguay→Rumania
120	PER→VEN	Peru→Venezuela
121	PHI→CEY	Philippines→Ceylon
122	PHI→NEP	Philippines→Nepal
123	PHI→YEM	Philippines→Yemen
124	POL→EGP	Poland→Egypt
125	POL→ISR	Poland→Israel
126	POR→BUR	Portugal→Burma
127	POR→CAN	Portugal→Canada
128	POR→EGP	Portugal→Egypt
129	POR→NOR	Portugal→Norway
130	RUM→NEP	Rumania→Nepal
131	RUM→NTH	Rumania→Netherlands
132	RUM→OUT	Rumania→Outer Mongolia
133	RUM→PAR	Rumania→Paraguay
134	SAU→AUL	Saudi Arabia→Australia
135	SAU→ISR	Saudi Arabia→Israel
136	SPN→CHN	Spain→China
137	SPN→DEN	Spain→Denmark
138	SPN→INS	Spain→Indonesia
139	SWD→DOM	Sweden→Dominican Republic
140	SWD→HON	Sweden→Honduras
141	SWZ→IRE	Switzerland→Ireland
142	SYR→LBR	Syria→Liberia
143	TAI→ELS	Thailand→El Salvador
144	TAI→ETH	Thailand→Ethiopia
145	TAI→PAK	Thailand→Pakistan
146	TUR→YEM	Turkey→Yemen
147	USR→ALB	USSR→Albania
148	USR→CHN	USSR→China
149	USR→USA	USSR→USA
150	UNK→ARG	United Kingdom→Argentina
151	USA→FRN	USA→France
152	USA→OUT	USA→Outer Mongolia
153	USA→USR	USA→USSR
154	URA→DEN	Uruguay→Denmark
155	URA→GRC	Uruguay→Greece
156	URA→GUA	Uruguay→Guatemala
157	URA→HUN	Uruguay→Hungary
158	URA→IRN	Uruguay→Iran
159	VEN→PER	Venezuela→Peru
160	YEM→CHN	Yemen→China
161	YEM→PHI	Yemen→Philippines
162	YEM→TUR	Yemen→Turkey
163	YUG→AFG	Yugoslavia→Afghanistan
164	YUG→ECU	Yugoslavia→Ecuador
165	YUG→GUA	Yugoslavia→Guatemala
166	YUG→NEW	Yugoslavia→New Zealand

2.3 <u>Dyadic Selected Sample</u>. The random sample was chosen on the basis of a <u>random number table</u>, as described in the above list, so that inferences could be made from the sample to all dyadic relations for the years of interest. The following selected list of dyads represents all the paired relationships between nations, chosen to represent the high, middle, and low values of countries on the major factors emerging from 236 variable by 82 nations[32] and 94 variable by 82 nation factor analyses.[33] Each of the high, middle, and low positions on each dimension is represented by at least two nations. In order to index the major cultural and regional groupings of nations, Cattell's[34] and Russett's[35] studies were used to identify individual countries that were central to a cultural or regional cluster of nations.

The selected list of dyads insures that the full scope of differences and similarities <u>among</u> nations will be analyzed as they relate to interaction <u>between</u> nations. Since the selected sample is non-random, it does not allow for generalization to the universe. The results of the factor analysis of the selected sample may be used, however, in prediction studies of behavior, such as cooperation or conflict, where the interest is centered on regression coefficients. (In the regression model the <u>predictors</u> may be selected to index their full range of values.)

The dyadic selected sample for 1950 is the same as that analyzed in 1955 and 1963, although, of course, the random samples all differ. Having a constant dyadic selected sample across the three years enables a measurement of change in dyadic behavior.

The selected sample is as follows:

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[32]This analysis is referenced in footnote 26.

[33]R. J. Rummel, "Some Dimensions in the Foreign Behavior of Nations," <u>Journal of Peace Research</u>, No. 3, 1966.

[34]Raymond Cattell, "The Principal Culture Patterns Discoverable in the Syntal Dimensions of Existing Nations," <u>The Journal of Social Psychology</u>, v. 32, 1950, 215-253.

[35]Bruce Russett, <u>ibid</u>.

I. Nations Included in the Selected Dyadic Sample

I.D.*		I.D.	
8.	Brazil	41.	Israel
10.	Burma	44.	Jordan
15.	China	52.	Netherlands
19.	Cuba	62.	Poland
24.	Egypt	73.	USSR
36.	India	74.	United Kingdom
37.	Indonesia	75.	USA

II. Selected Dyadic Sample

I.D.**	Code	Dyad	I.D.	Code	Dyad
1.	BRA→BUR	Brazil→Burma			
2.	BRA→CHN	Brazil→China	34.	CHN→JOR	China→Jordan
3.	BRA→CUB	Brazil→Cuba	35.	CHN→NTH	China→Netherlands
4.	BRA→EGP	Brazil→Egypt	36.	CHN→POL	China→Poland
5.	BRA→IND	Brazil→India	37.	CHN→USR	China→USSR
6.	BRA→INS	Brazil→Indonesia	38.	CHN→UNK	China→United Kingdom
7.	BRA→ISR	Brazil→Israel	39.	CHN→USA	China→USA
8.	BRA→JOR	Brazil→Jordan	40.	CUB→BRA	Cuba→Brazil
9.	BRA→NTH	Brazil→Netherlands	41.	CUB→BUR	Cuba→Burma
10.	BRA→POL	Brazil→Poland	42.	CUB→CHN	Cuba→China
11.	BRA→USR	Brazil→USSR	43.	CUB→EGP	Cuba→Egypt
12.	BRA→UNK	Brazil→United Kingdom	44.	CUB→IND	Cuba→India
13.	BRA→USA	Brazil→USA	45.	CUB→INS	Cuba→Indonesia
14.	BUR→BRA	Burma→Brazil	46.	CUB→ISR	Cuba→Israel
15.	BUR→CHN	Burma→China	47.	CUB→JOR	Cuba→Jordan
16.	BUR→CUB	Burma→Cuba	48.	CUB→NTH	Cuba→Netherlands
17.	BUR→EGP	Burma→Egypt	49.	CUB→POL	Cuba→Poland
18.	BUR→IND	Burma→India	50.	CUB→USR	Cuba→USSR
19.	BUR→INS	Burma→Indonesia	51.	CUB→UNK	Cuba→United Kingdom
20.	BUR→ISR	Burma→Israel	52.	CUB→USA	Cuba→USA
21.	BUR→JOR	Burma→Jordan	53.	EGP→BRA	Egypt→Brazil
22.	BUR→NTH	Burma→Netherlands	54.	EGP→BUR	Egypt→Burma
23.	BUR→POL	Burma→Poland	55.	EGP→CHN	Egypt→China
24.	BUR→USR	Burma→USSR	56.	EGP→CUB	Egypt→Cuba
25.	BUR→UK	Burma→United Kingdom	57.	EGP→IND	Egypt→India
26.	BUR→USA	Burma→USA	58.	EGP→INS	Egypt→Indonesia
27.	CHN→BRA	China→Brazil	59.	EGP→ISR	Egypt→Israel
28.	CHN→BUR	China→Burma	60.	EGP→JOR	Egypt→Jordan
29.	CHN→CUB	China→Cuba	61.	EGP→NTH	Egypt→Netherlands
30.	CHN→EGP	China→Egypt	62.	EGP→POL	Egypt→Poland
31.	CHN→IND	China→India	63.	EGP→USR	Egypt→USSR
32.	CHN→INS	China→Indonesia	64.	EGP→UNK	Egypt→United Kingdom
33.	CHN→ISR	China→Israel	65.	EGP→USA	Egypt→USA
			66.	IND→BRA	India→Brazil

* This I.D. is from the nation listing, Section 2.1.
**The selected dyad's I.D. is the same as employed in 1955 and 1963.

I.D.	Code	Dyad	I.D.	Code	Dyad
67.	IND→BUR	India→Burma	116.	JOR→UNK	Jordan→United Kingdom
68.	IND→CHN	India→China	117.	JOR→USA	Jordan→USA
69.	IND→CUB	India→Cuba	118.	NTH→BRA	Netherlands→Brazil
70.	IND→EGP	India→Egypt	119.	NTH→BUR	Netherlands→Burma
71.	IND→INS	India→Indonesia	120.	NTH→CHN	Netherlands→China
72.	IND→ISR	India→Israel	121.	NTH→CUB	Netherlands→Cuba
73.	IND→JOR	India→Jordan	122.	NTH→EGP	Netherlands→Egypt
74.	IND→NTH	India→Netherlands	123.	NTH→IND	Netherlands→India
75.	IND→POL	India→Poland	124.	NTH→INS	Netherlands→Indonesia
76.	IND→USR	India→USSR	125.	NTH→ISR	Netherlands→Israel
77.	IND→UNK	India→United Kingdom	126.	NTH→JOR	Netherlands→Jordan
78.	IND→USA	India→USA	127.	NTH→POL	Netherlands→Poland
79.	INS→BRA	Indonesia→Brazil	128.	NTH→USR	Netherlands→USSR
80.	INS→BUR	Indonesia→Burma	129.	NTH→UNK	Netherlands→United Kingdom
81.	INS→CHN	Indonesia→China	130.	NTH→USA	Netherlands→USA
82.	INS→CUB	Indonesia→Cuba	131.	POL→BRA	Poland→Brazil
83.	INS→EGP	Indonesia→Egypt	132.	POL→BUR	Poland→Burma
84.	INS→IND	Indonesia→India	133.	POL→CHN	Poland→China
85.	INS→ISR	Indonesia→Israel	134.	POL→CUB	Poland→Cuba
86.	IND→JOR	Indonesia→Jordan	135.	POL→EGP	Poland→Egypt
87.	IND→NTH	Indonesia→Netherlands	136.	POL→IND	Poland→India
88.	IND→POL	Indonesia→Poland	137.	POL→INS	Poland→Indonesia
89.	IND→USR	Indonesia→USSR	138.	POL→ISR	Poland→Israel
90.	IND→UNK	Indonesia→United Kingdom	139.	POL→JOR	Poland→Jordan
91.	IND→USA	Indonesia→USA	140.	POL→NTH	Poland→Netherlands
92.	ISR→BRA	Israel→Brazil	141.	POL→USR	Poland→USSR
93.	ISR→BUR	Israel→Burma	142.	POL→UNK	Poland→United Kingdom
94.	ISR→CHN	Israel→China	143.	POL→USA	Poland→USA
95.	ISR→CUB	Israel→Cuba	144.	USR→BRA	USSR→Brazil
96.	ISR→EGP	Israel→Egypt	145.	USR→BUR	USSR→Burma
97.	ISR→IND	Israel→India	146.	USR→CHN	USSR→China
98.	ISR→INS	Israel→Indonesia	147.	USR→CUB	USSR→Cuba
99.	ISR→JOR	Israel→Jordan	148.	USR→EGP	USSR→Egypt
100.	ISR→NTH	Israel→Netherlands	149.	USR→IND	USSR→India
101.	ISR→POL	Israel→Poland	150.	USR→INS	USSR→Indonesia
102.	ISR→USR	Israel→USSR	151.	USR→ISR	USSR→Israel
103.	ISR→UNK	Israel→United Kingdom	152.	USR→JOR	USSR→Jordan
104.	ISR→USA	Israel→USA	153.	USR→NTH	USSR→Netherlands
105.	JOR→BRA	Jordan→Brazil	154.	USR→POL	USSR→Poland
106.	JOR→BUR	Jordan→Burma	155.	USR→UNK	USSR→United Kingdom
107.	JOR→CHN	Jordan→China	156.	USR→USA	USSR→USA
108.	JOR→CUB	Jordan→Cuba	157.	UNK→BRA	United Kingdom→Brazil
109.	JOR→EGP	Jordan→Egypt	158.	UNK→BUR	United Kingdom→Burma
110.	JOR→IND	Jordan→India	159.	UNK→CHN	United Kingdom→China
111.	JOR→INS	Jordan→Indonesia	160.	UNK→CUB	United Kingdom→Cuba
112.	JOR→ISR	Jordan→Israel	161.	UNK→EGP	United Kingdom→Egypt
113.	JOR→NTH	Jordan→Netherlands	162.	UNK→IND	United Kingdom→India
114.	JOR→POL	Jordan→Poland	163.	UNK→INS	United Kingdom→Indonesia
115.	JOR→USR	Jordan→USSR	164.	UNK→ISR	United Kingdom→Israel

I.D.	Code	Dyad
165.	UNK→JOR	United Kingdom→Jordan
166.	UNK→NTH	United Kingdom→Netherlands
167.	UNK→POL	United Kingdom→Poland
168.	UNK→USR	United Kingdom→USSR
169.	UNK→USA	United Kingdom→USA
170.	USA→BRA	USA→Brazil
171.	USA→BUR	USA→Burma
172.	USA→CHN	USA→China
173.	USA→CUB	USA→Cuba
174.	USA→EGP	USA→Egypt
175.	USA→IND	USA→India
176.	USA→INS	USA→Indonesia
177.	USA→ISR	USA→Israel
178.	USA→JOR	USA→Jordan
179.	USA→NTH	USA→Netherlands
180.	USA→POL	USA→Poland
181.	USA→USR	USA→USSR
182.	USA→UNK	USA→United Kingdom